

REMARKS

Claims 1-13 have been cancelled. New claims 14-29 are directed to a method of producing soft paper comprising adding a paper additive composition to pulp. The paper additive composition includes the amide compound (a) originally present in claim 1. Methods for producing paper using the additive composition of original claim 1 had been presented in claims 5-7 and 11-13. However, new claim 14 specifies that the method is directed to producing soft paper. Support therefor appears at least at page 12, lines 18-22 of the specification.

Claim 18, which depends from claim 14, also requires the inclusion of the ammonium compound (b) in the paper additive composition. Support for claim 18 is found at least at page 15, line 29 to page 16, line 5 and page 17, lines 17-20. The weight ratio specified in claim 18 for the amide compound (a) and the ammonium compound (b) is based on the description at page 15, line 29 to page 16, line 5 of the specification, which describes that the ammonium (b) compound can be contained at a ratio of 1 to 300 parts by weight per 100 parts by weight of the amide compound (a).

New claim 22 also depends from claim 14 and requires that the paper additive composition further includes a polyacrylamide compound (c). The weight ratio of the amide compound (a) to the polyacrylamide compound (c) specified in claim 22 is based on the description at page 17, lines 6-8 that the polyacrylamide compound (c) is contained at a ratio of 1 to 200 parts by weight per 100 parts by weight of amide compound (a). Claim 22 is further supported by the description at page 17, lines 20-23.

New claim 26 depends from claim 18 and requires each of the polyacrylamide compound (c), the ammonium compound (b) and the amide compound (a). Support therefor appears at least at page 17, lines 12-16 of the specification, with the weight ratio of the amide compound (a) to the polyacrylamide compound (c) supported as described for claim 22. Accordingly, no new matter has been added.

New claims 15, 19, 23 and 27 are supported at least by the description at page 8, lines 9-17 of the specification. New claims 16, 17, 21, 24, 25, 28 and 29 are supported in the specification at page 18, lines 6-15.

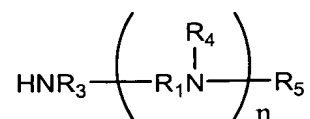
As such, the present invention as defined by claim 14 is directed to the use of a paper softening additive that includes an amide compound (a) for producing soft paper.

The specific amide compound (a) specified in claim 14 for preparing a paper, which is obtained from the specific polyamine and the specific carboxylic acid, satisfies the ratio of a tertiary amine value that is the chemical characteristic value and a total amine value that is the chemical characteristic value of 0.60 to 0.99, thereby obtaining a paper with high level of softness. This feature is not taught or suggested by the prior art of record.

The ratios of the amide compound (a) to the ammonium compound (b) in claim 18 provides a paper having a high level of softness and reduces the occurrence of paper dust. The combined use of the amide compound (a) with the polyacrylamide compound (c) in the ratio set forth in claim 22 provides a paper with a high level of softness and suppresses the reduction of paper strength. The combined use provides an effect of good retention and drainage in the paper formation process.

Previous claims 3-6, 10, 12 and 13 were rejected under 35 U.S.C. §102(b) for anticipation by WO 01/59213 to Howland et al. Prior claims 2, 7-9 and 11 were rejected under 35 U.S.C. §103(a) for obviousness over Howland in view of U.S. Patent No. 6,162,329 to Vinson et al. and U.S. Patent No. 6,033,523 to Dwiggins et al. Applicants respectfully traverse these rejections as applied to new claims 14-29.

Howland discloses that an amide compound may be used as a paper additive agent and sets forth a polyaminoamide compound having the following formula:



wherein R₁ is a hydrocarbon side chain of a saturated or unsaturated fatty acid; R₃, R₄, and R₅ are independently selected at each occurrence from H and R₂C(O)- and n is 2, 3, 4, or 5, provided that at least one of R₃, R₄, and R₅ are H and at least one of R₃, R₄, and R₅ are R₂C(O)-. Furthermore, in another preferred aspect, at least two of R₃, R₄, and R₅ are H and at least one of R₃, R₄, and R₅ are R₂C(O)-. In another preferred aspect, the polyaminoamide is prepared by reacting two molar equivalents of the fatty acids with one molar equivalent of the polyamines. In another preferred aspect, the polyamines are selected from diethylenetriamine, triethylenetetramine, tetraethylenepentamine and pentaethylenehexamine.

In another preferred aspect, the fatty acid is selected from behenic acid, stearic acid, myristic acid and oleic acid.

However, the amide compound (a) used in the present invention is a particular amide compound obtained from the specific polyamine and the specific carboxylic acid set forth in claim 14 and satisfies the specific ratio of a tertiary amine value to the total amine value of the amide compound of 0.60 to 0.99. This amide compound is distinct from the amide compound disclosed in Howland.

The importance of the specific amide compound set forth in claim 14 is elucidated by referring to Example 3.5 and Comparative Example 3.3 appearing in Table 4 of the present application. In Example 3.5 when the amide compound (a) having a ratio of tertiary amine value to total amine value of 0.61 was used, the paper had a high level of softness. On the other hand, as reported in Comparative Example 3.3, when the amide compound having a ratio of tertiary amine value to total amine value of amide compound (a) was only 0.52, a high level of softness could be obtained. This demonstrates that when the amide compound (a) is a specific amide compound obtained from the claimed polyamine and carboxylic acid and satisfies the claimed ratio of a tertiary amine value (a chemical characteristic) and a total amine value (a chemical characteristic) of 0.60 to 0.99, a paper having a high level of softness can be obtained. In the absence of any teaching or suggestion in Howland to produce soft paper using the amide compound of claim 14, having the ratio of tertiary amine value to total amine value of 0.60 to 0.99, claims 14-29 define thereover.

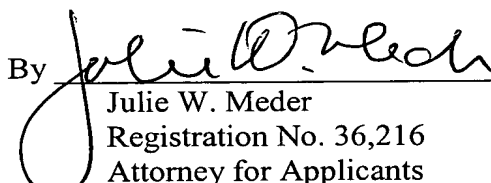
The Vinson and Dwiggins patents were cited for disclosing certain softening agents comprising quaternary ammonium compounds in Vinson and disclosing that softeners can be added as mixtures to produce a soft sheet. These disclosures do not overcome the basic failure of the Howland patent to teach or suggest the method of producing soft paper as set forth in claim 14. Moreover, the quaternary ammonium compounds described in Vinson and Dwiggins are distinct from the specific quaternary ammonium compound (b) required in new claims 18-21, and 26-29. Nowhere do any of the cited references suggest the combination of their teachings to combine the particular components of the amide compound (a) of claim 14, along with the quaternary ammonium compound (b) of the present invention. Accordingly, claim 18 and the claims that depend therefrom define thereover.

Claim 22 is directed to the combined use of the specific amide compound (a) of claim 14, along with a specific polyacrylamide (c) in a particular ratio. While Vinson and Dwiggins disclose that a polyacrylamide can be used as a wet strength agent, nowhere do any of the cited references teach or suggest the combination of the specific amide compound (a) of claim 14, with the specific polyacrylamide (c) of claim 22 in the recited ratio. Nowhere do the Howland, Vinson and Dwiggins patents together teach or suggest the particular combination of the specific amide compound (a) and polyacrylamide component (c) to provide a paper with a high level of softness that suppresses a reduction of paper strength. Accordingly, claim 22 and the claims which depend therefrom, define over the prior art of record.

Claim 26 is directed to a method which uses each of the components (a), (b) and (c) in a specific ratio to provide a paper with a high level of softness and that also reduces the occurrence of paper dust and prevents reduced paper strength. This combination also improves the retention and drainage in the paper formation process. As noted above, none of the applied references teaches or suggests the method of claim 26 in which each of components (a), (b) and (c) are included in a paper additive composition. Accordingly, claims 14-29 define over the prior art of record and are in condition for allowance.

Respectfully submitted,

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